GANDHI ACADEMY OF TECHNOLOGY AND ENGINEERING

LESSON PLAN

**Session (2023-2024)**

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| **Discipline:**  **Mechanical Engineering No. of Days/Week: 04** | **Semester: 4th** | **Name of the Teaching Faculty:**  **Mr. Suvranta Kumar Tripathy**  **FLUIDMECHANICS-TH 03**  **Email ID:** [**trinathpatro1994@gmail.com**](mailto:trinathpatro1994@gmail.com) |

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| **Week** | **Class Day** | **Theory/Practical Topics** |
| 1st | 1st | **Properties of fluid**:  Definition and units of fluid properties like density,  specific weight, specific volume and specific gravity. |
| 2nd | Numerical |
| 3rd | Definition and units of fluid properties such as viscosity, kinematic viscosity. |
| 4th | surface tension and capillarity |
| 2nd | 1st | **Fluid pressure and its measurements**  Definitions and units of fluid pressure, pressure intensity and pressure head. Pascal’s Law. |
| 2nd | Concepts of atmospheric, gauge, vacuum and absolute  pressure. |
| 3rd | Pressure Measuring instruments: Manometers (simple, differential and piezometers), |
| 4th | Numerical |
| 3rd | 1st | Numerical |
|  | 2nd | Mechanical Gauges (Bourdon’s tube pressure gauge) |
|  | 3rd | *Doubt clearing Class* |
|  | 4th | *Assignment Evaluation / Class Test* |
| 4th | 1st | **Hydrostatics**  Definition of hydrostatic pressure, total pressure and centre  of pressure. |
|  | 2nd | Total pressure and centre of pressure of immersed  horizontal bodies |

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|  | 3rd | Total pressure and centre of pressure of immersed vertical bodies |
|  | 4th | Numerical |
| 5th | 1st | Concept of flotation, buoyancy, centre of buoyancy, Archimedes principle |
|  | 2nd | Metacentre and metacentric height |
|  | 3rd | Numerical |
|  | 4th | *Doubt clearing Class* |
| 6th | 1st | *Quiz Test* |
|  | 2nd | **Kinematics of Flow**  Types of fluid flow |
|  | 3rd | Continuity equation (statement and proof), Numerical |
|  | 4th | Numerical |
| 7th | 1st | State and Prove Bernoulli’s equation, |
|  | 2nd | Limitations of Bernoulli’s theorm |
|  | 3rd | Numerical |
|  | 4th | Practical applications of Bernoulli’s equation: Venturi meter and Pitot tube. |
| 8th | 1st | Numerical |
|  | 2nd | *Doubt Clearing class* |
|  | 3rd | *Assignment Evaluation / Class Test* |
|  | 4th | **Orifices, notches & weirs**  Definition of Orifice, Types |
| 9th | 1st | Orifice co-efficient and relation among them. |
|  | 2nd | Definition of notch and weir,  Classifications of notches & weirs |
|  | 3rd | Discharge over a rectangular notch or weir. |
|  | 4th | Discharge over a triangular notch or weir |
| 10th | 1st | Numerical |
|  | 2nd | Numerical |
|  | 3rd | *Doubt Clearing Class* |
|  | 4th | **Flow through pipe:**  Darcy-Weisbach formula, Numerical |
| 11th | 1st | Chezy’s formula for loss of head due to friction in pipes. Numerical |
|  | 2nd | Pipe losses, Hydraulic Gradient, Total Energy Line. |
|  | 3rd | Numerical |
|  | 4th | *Doubt Clearing Class* |
| 12th | 1st | *Assignment Evaluation / Class Test* |

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|  | 2nd | **Impact of jets**  Force exerted by the Impact of jet on a stationary vertical plate |
|  | 3rd | Numerical |
|  | 4th | Force exerted by a jet on a moving Vertical flat plate, |
| 13th | 1st | Numerical |
|  | 2nd | Derivation of work done on series of vanes and condition for maximum efficiency. |
|  | 3rd | Numerical |
|  | 4th | Impact of jet on moving curved vanes, illustration  using velocity triangles, derivation of work done, efficiency. |
| 14th | 1st | Numerical |
|  | 2nd | *Assignment Evaluation / Class Test* |
|  | 3rd | *Doubt Clearing Class* |
|  | 4th | *Practice test* |
| 15th | 1st | *Practice test* |
|  | 2nd | *Revision* |
|  | 3rd | *Revision* |
|  | 4th | *Discussion of previous year questions* |